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GOVERNMENT RESEARCH AND DEVELOPMENT DIGEST

Army Satellite Being Readied

In this issue . . .

TOP SECRETS? by Martin Caidin

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OUR COVER

Army may soon get its turn. Missile technicians at the Army Ballistic Missile Agency, Huntsville, Ala., assemble the Army's shell-shaped satellite and final stage rocket, designed to orbit as a single unit. Vehicle will be JUPITER-C.

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by Martin Caidin

TOP

The secrecy cloak which allegedly surrounds th development and testing of this country's missile weapo has disintegrated to a shabby cloth through which a mo of observers peers with undisguised and intense interes Security officers at the Air Force Missile Test Center i particular can be heard gnashing their teeth in rage an frustration. Almost every time a new bird is fired fro Cape Canaveral Auxiliary Air Force Base, an interest throng heavily laden with cameras and telephoto lens crowds around the "security fences" and along th beaches to record the launching and oftimes the demise o the latest products of our missile technology.

It is incredible, but even before missile engineers a AFMTC have completed their elaborate reports of wha caused their latest creation to howl into the Atlantic they're liable not only to see photographs in magazine of the latest mishaps, but can find in print details of wh several million dollars of rocket malfunctioned.

Take the case of the ATLAS launchings in June, 1957. Hardly had this missile's gimbal control fizzled, causing the range safety officer to destruct the bird in climb, when the nation knew of the details. Every time a missile blow up with a stupendous roar, you can read details not only of when the missile exploded, but *why*. The working details of the birds—ATLAS, THOR, JUPITER and the others—are wide open, it seems, to half the trade editors in the country. Not only has *secret* and *top secret* data found its way with astonishing accuracy into the trade press, but if you'll take the trouble to scour out-of-the-way publications, you can find both photographs and painting (accurate) of the ATLAS, NAVAHO, TITAN and other "secret" birds.

How is this possible? How can there be such vast holes in the security wall that anyone with a fair knowledge of the subject can reach in and pluck for his own study the

ECRETS?

most up-to-date data of our nation's missile research—*and print that data?*

The basic problem, of course, has historical precedent. People talk too much. This disease of wagging of the jaw has driven security people to distraction, and it's damned difficult to stop. This writer personally witnessed on the west coast, a session in which alcohol flowed freely and two magazine editors deliberately involved an engineer in a heated argument; it ended with ego and a loosened tongue spilling a lot of beans about a certain still highly classified missile. It happens too often.

The second problem is that some things just can't be kept secret. You cannot hide certain weapons; they've got to fly through the air, in public view. Originally, USAF wanted to purchase all the land surrounding Cape Canaveral—for the basic purpose of the security it requires, so that all those people with long noses and telephoto lenses would be kept far back from the launching sites. The attempt was nixed; the powers-that-be felt that USAF wanted to spend money too freely. So, anyone can still sidle right up to the Canaveral fences. Someone, nearly eight years ago, really goofed. For the want of the cash to purchase some cheap real estate, you have only to read the right magazines to see too many of our highest secrets.

This problem isn't helped any by those Russian submarines with ultrasensitive electronic and optical equipment which cruise the waters off Cape Canaveral. Every time a bird flies, the Russians track the missile and record the details of flight, thus providing the USSR intelligence crowd with just the data they want to know.

The most pressing security problems, however, can't be solved by the Air Police shoving the mobs back from Canaveral's wire fences (through which people have

TOP SECRETS? Continued

crawled, and then walked around the "secret" Cape, completely unmolested). This problem exists right in that five-sided building in Virginia, where the Department of Defense people dream up the incomprehensible security regulations under which our military and press media have to slog. If the Pentagon would only work out some sensible press-security system, and select judiciously what is secret and what isn't, there wouldn't be such a rush to get anything into print which a roving editor can beg, borrow, or steal.

Let's face the fact. The biggest security block is the confusion from DOD which attempts, it appears, to classify virtually *everything*. When Wilson's aide, Karl Hanaman, occupied a seat in the Pentagon, he even went so far as to stamp *classified* a statement of the President's which had appeared on the front page of the New York Times!

It is this wildly-waved censorship stamp which leads so many editors to believe that the security regulations of DOD were dreamed up in the dark by a bunch of idiot bricklayers.

And these problems had better be solved quickly. For we know distressingly little of USSR missile development, while they have an open window through which to look, and observe in detail, our activities. Keep this up long enough, and we'll eventually reach the point where we may as well invite Kremlin representatives into the design conferences of our engineers.

Some people feel we're ridiculously close to that point. Proof of this can be found in the collection of *printed* missile data assembled by a writer. When he typed up what he had found in newsstand publications and checked it against security—he had a document that was 90 percent secret. and legally subjected him to prosecution for illegal ownership of classified documents!

A recent occurrence that illustrates the incredible aspects of U. S. security involved a nationally known writer who has just completed a book with serious political-military implications.

This writer noticed photographs which had been reproduced in an official publication. The photos were unavailable from the Pent. The writer called the AF Missile Test Center with a direct request, coordinated with the Pentagon for these pix. Writer discovered that pix had been obtained from AFMTC by another AF officer who used them in an official publication. Regulations required that the personnel involved at AFMTC forward the already published photographs to the writer through the offices of the ARDC.

ARDC, unhappy because it had not released the photographs directly, immediately classified all the photos in question. It required considerable desk thumping and agitation on the part of several people both in uniform and in civilian clothes to get these pictures declassified—six weeks after they had been requested and several months after they had been previously published.

Editor's note: The views expressed here are those of the writer, Mr. Martin Caidin.

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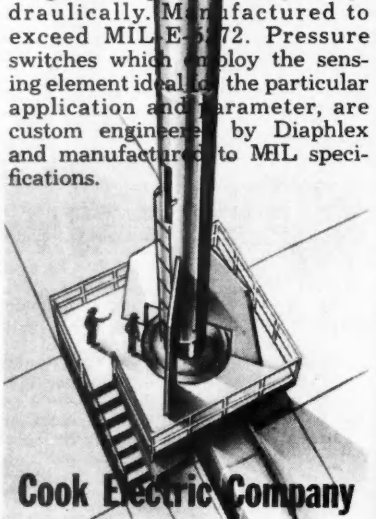

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Operational Requirements

Operational Requirements are expressed military needs which come from more than one isolated source. An Operational Requirement may or may not become an advertised or negotiated bid dependent upon the strength of the need and the feasibility of manufacture as determined by technical review officers. Sources for more information on the needs listed below are furnished on request. Write DATA, Dupont Circle Building, Washington 6, D. C.

589. TRACKING DEVICES:
New method for tracking space vehicles with higher accuracy than presently available with current electronic gear needed. System must not be limited by weather, visibility or present optical viewing equipment. Three dimensional means of representing missile trajectory desired.

590. PROPULSION OF MISSILES:
Smokeless, flashless, noiseless propellants needed. Solid propellants that can be throttled or otherwise controlled by rocket motor operator desired. Disposable rocket motors that completely consume themselves after burning would solve important problem in booster propulsion systems.

591. AIRPLANE MANEUVER RESTRICTOR:
Develop governor pressure restrictor to prevent or make it very difficult for pilot to overstress his plane during maneuvers. Especially desired in Mach 2 and faster aircraft.

592. UNIVERSAL LANDING GEAR FOR LIGHT AIRCRAFT:
Gear should be suitable for water, snow, sand or land. Lightweight amphibious landing gear for helicopters also needed.

593. HELICOPTER ATTITUDE INDICATOR:
Device should show correct attitude of fuselage in hover and flight as well as drift in any direction.

594. RADICAL METHODS OF SHIP DISCHARGE:
Faster methods of unloading ships very much needed. New methods of getting military supplies from ship to beach faster would be strongly welcomed. Specifically requested are: flexible and lightweight high-line for unloading ships lying off shore, method of spotting cargo in ship's hold beyond the square of the hatch, and winch gear permitting operator to keep load in sight at all times.

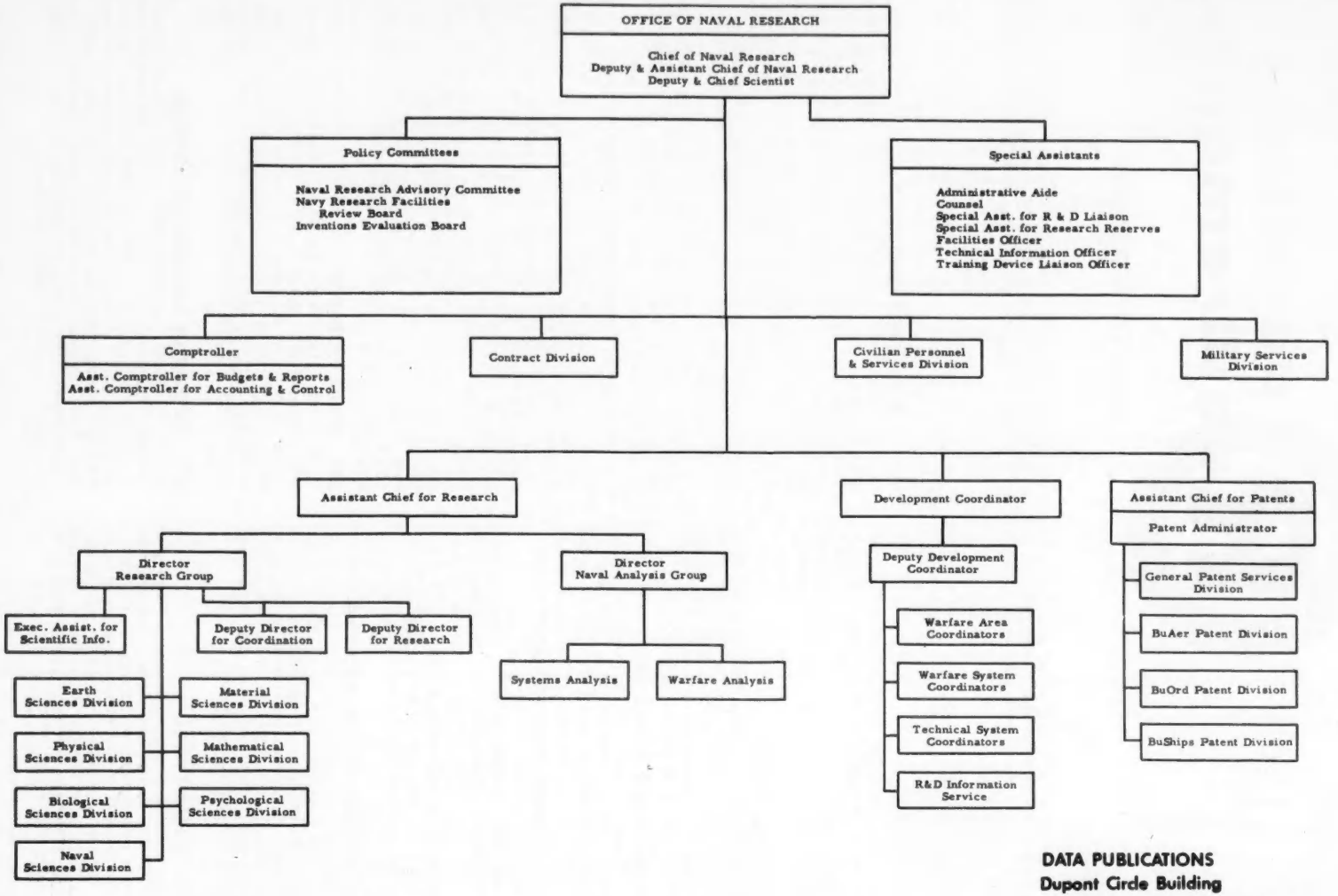
595. IMPROVED STRAIN GAUGE:
Required for use in temp ranges from minus 70 to plus 1500 degrees (F). Also wanted are: fatigue damage indicator to identify impending material failure in propellors, roto blades, etc.; portable device to measure pre-stresses set up in nut and bolt assemblies; non-destructive means for determining defects of structural sandwich material, and non-destructive method for determining temper in monolithic or laminated glass.

596. SURFACE TREATMENT NEEDS:
Plastics: Need alcali and acid resistant coatings, permanent antistatic coatings or fibres and a resurfacer to remove haze and scratches in cockpit canopies. Also, need treatment for machined plastic edges to restore resistance to moisture absorption.
Metals: Need coatings to protect stainless steel above 200 degrees (F), magnesium in dissimilar metal contact for marine environment and a metallic film to make magnesium wear resistant. Also, oil soluble vapor phase corrosion inhibitors that penetrate into minute metallic cracks and crevices.
To evaluate surface treatments: Quick and accurate test is sought for rust preventatives in terms of total service life and a non-destructive test for adhesion of coatings to metals and wood that provides quantitative values.

597. CHEMICALS FOR MELTING SNOW OR ICE:
Develop a chemical or other material that is capable of melting snow or ice at temperatures as low as minus 65 degrees (F). The material must have no corrosive effect on metals used in aircraft. Material would be used after bulk of snow and ice had been removed by conventional snow plows. The needed material is desired to remove the thin, hard layer of snow or ice that remains after the plows. Snow and ice remaining in this film would be melted by sprinkling it with the desired material. Presently calcium chloride is use for this purpose. However, it has corrosive effect on metals and is therefore unsatisfactory. Heated sand is used but is too cumbersome and unwieldy. Neither material is sufficiently effective at minus 65 degrees (F).

598. QUICK COUPLING:
High strength, lightweight coupling is needed for connecting lengths of fiber glass or metal gasoline pipe. Should handle pipe up to 8 inches in diameter, for use as temporary or permanent gasoline transmission line operating at 800 p.s.i. working pressure. Coupling must lend itself to quick connecting and disconnecting without mutilating the pipe.

599. METHOD OF HEATING DRY BATTERIES:
Method is sought to develop small lightweight equipment suitable for heating dry batteries so that full output can be obtained in regions where temperatures drop to minus 65 degrees (F). Investigations and experiments have been conducted using heat tablets, sterno-type heaters, oxidation of thermophoric materials, activated charcoal blocks and chemical heaters. None of these, to date, has resulted in a practical battery heating device.



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2065	61447	905 Surveillance Systems, Mr. A. M. Rubenstein	1622	66901
2702	61795	906 Command-Control Systems, Mr. J. A. Krcek	1622	66901
2708	61151	907 Nullification Systems, Mr. N. J. Smith	1620A	65651
2710	62671	908 Logistic-Administrative Systems, Dr. E. D. Bovet	1620A	65651
2710	61538			
2704	64061	**TECHNICAL SYSTEMS COORDINATORS**		
		921 Acoustics, Infrared & Magnetics, Mr. B. Rosenberg	1608	62516
2066	62435	922 Navigation, Mr. H. F. Damron	1602	67328
2066	62435	923 Data Handling, Mr. A. J. Neumann	1606	62630
2703	63830	924 Radar, Mr. H. R. Moore	1608	62516
2707	61056	925 Radio & Internal Communications, Mr. E. F. Paroulek	1602	67328
2705	62414	926 Environmental Systems, Dr. C. C. Bates	1606	62630
2701	63843	931 Electronic Warfare, Mr. H. B. Stone	1602	67328
		932 Missiles and Ordnance, Mr. A. K. Weymouth	1604	64110
		933 Underwater Ordnance, Mr. S. R. Marcus	1604	64110
		942 Ships and Vehicles, Mr. T. L. Soo-Hoo	1604	64110
2062	61579	943 Propulsion, Dr. F. Schulman	1608	62516
2062	61579	961 Materials, Mr. R. E. Wiley	1606	62630
2062	61785	**REPORTS AND INFORMATION**		
2609	62600	910 Reports and Information, Mr. J. Gorman	1714	65788
2603	64991	911 Senior Technical Analyst, Miss B. Foster	1714	65788
2615	64047			

2541	66385
9thW	63251

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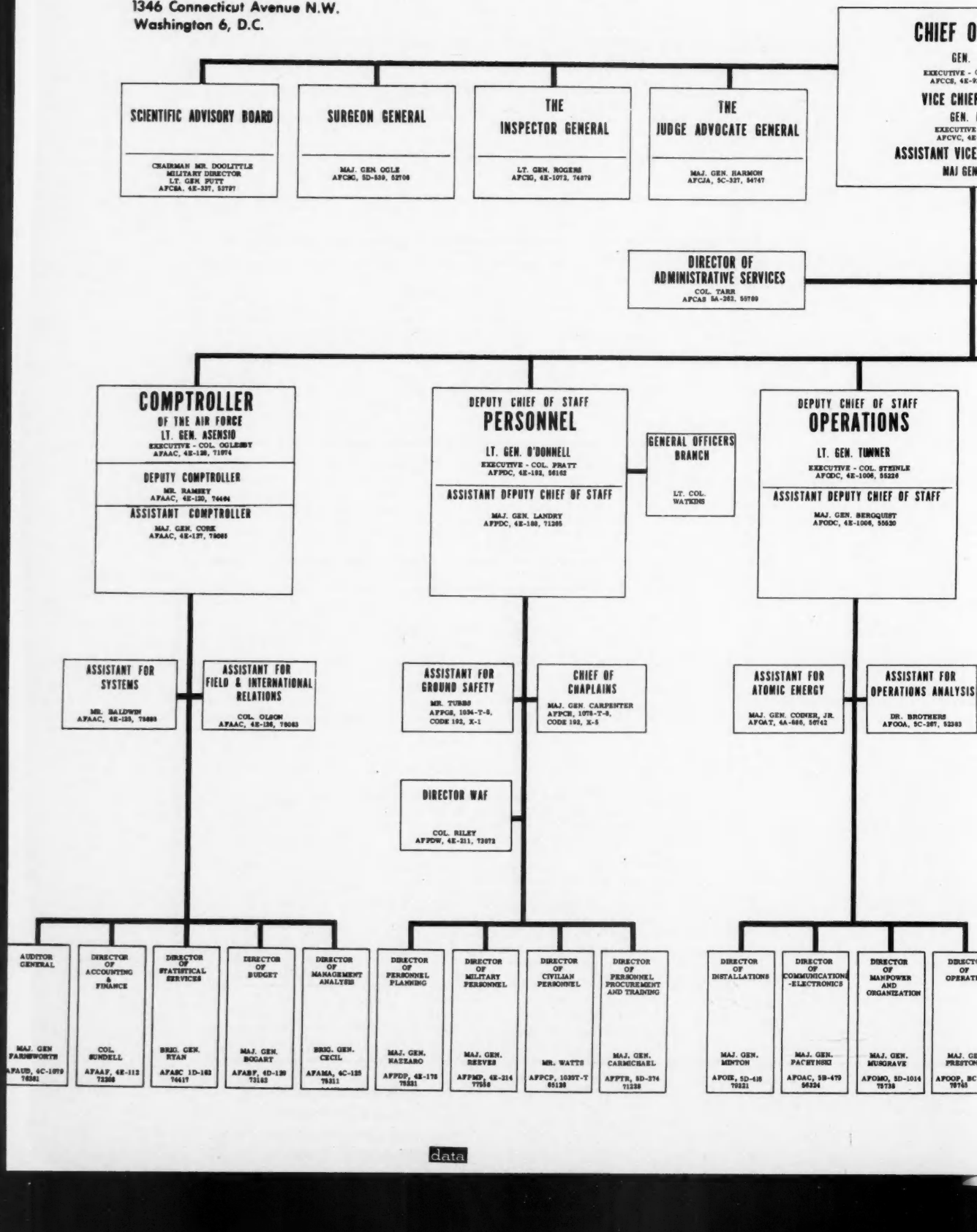

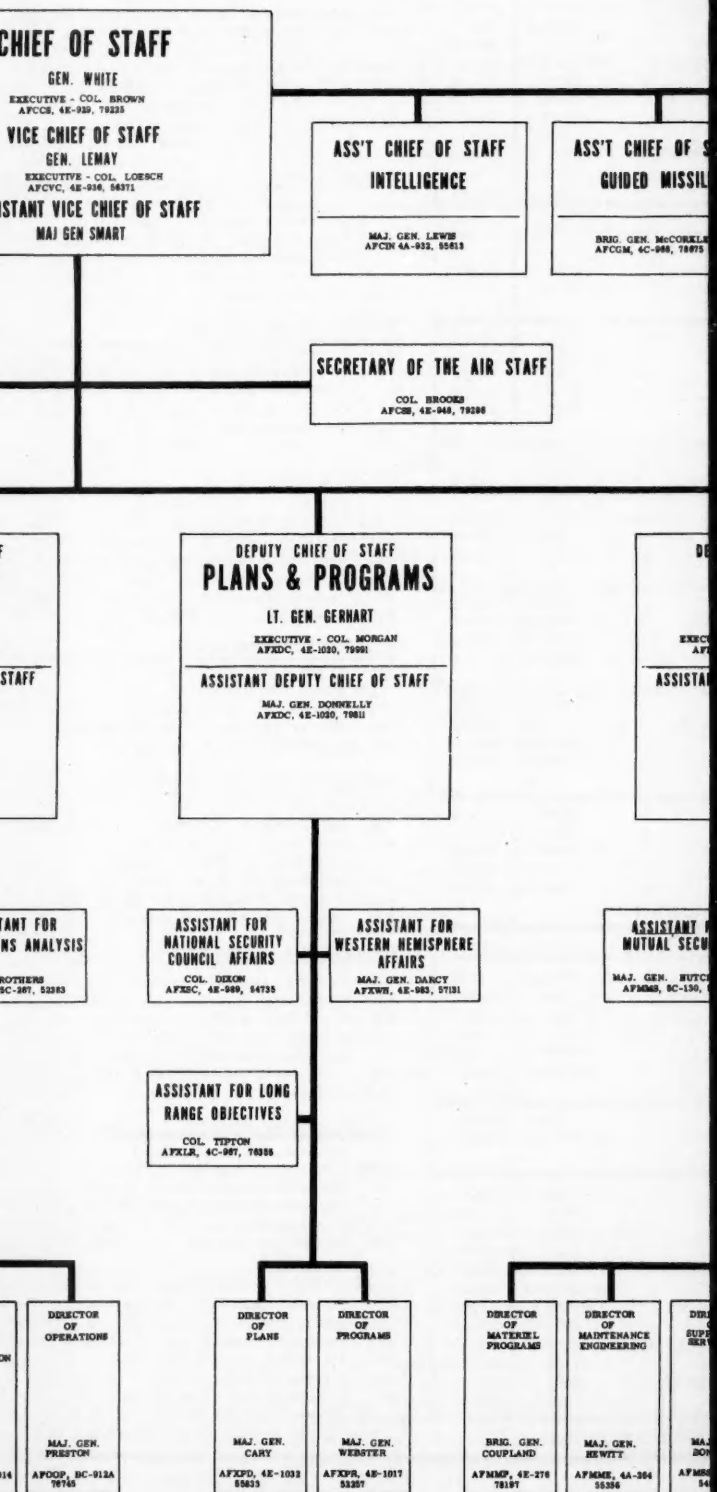
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VICE CHIEF OF STAFF
GEN. LEMAY
EXECUTIVE - COL. LOESCH
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ASSISTANT FOR
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AFXWH, 4E-983, 57131
ASSISTANT
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MAJ. GEN. HUTC
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RANGE OBJECTIVES
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AFXLR, 4C-987, 78355
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ENGINEERING
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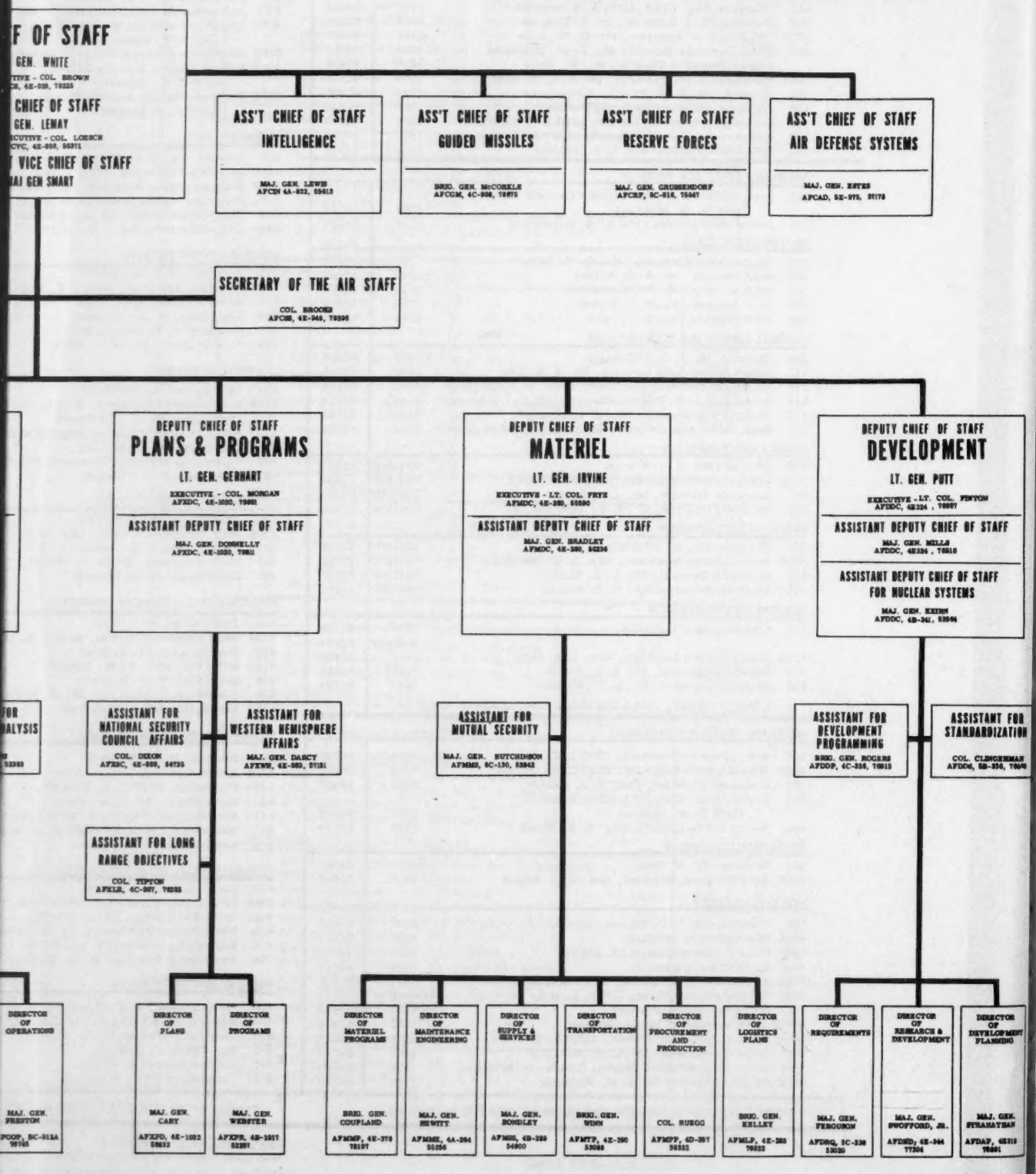
HEWITT
AFMME, 4A-304
56306

AIR STAFF
DEPARTMENT OF THE AIR FORCE



DECEMBER 1957

data

DOD DIRECTIVE 5129.9 OF DEC. 12, 1957

Subj: Research and Engineering Coordination Committee on Maintenance Engineering. WHAT IT DOES: Establishes committee to aid Asst SecDef (R&E). Committee to deal with all aspects of maintenance engineering. Members to be designated by Secretaries of Military Departments, Asst SecDef (Supply & Logistics) and Asst SecDef (R&E). Director of Maintenance Eng (OASD R&E) is chairman. 600.

DOD DIRECTIVE 4105.1 OF DEC. 6, 1957

Subj: Reports on Military Procurement. WHAT IT DOES: Requires reports from mil activities on major procurement actions. Five-part report to be submitted monthly on procurements valued at $10,000 or more. Quarterly reports on $25,000 purchases. Directive stresses information regarding size of seller, subtly points toward more small business. A semi-annual summary of procurement also required in lengthy six-page directive 4105.1 with attached six-page instruction form. 601.

DOD DIRECTIVE 4145.11 OF DEC. 2, 1957

Subj: Standards and procedures to be used by mil services in obtaining max efficiency in utilization of powered materials handling equipment. WHAT IT DOES: Applies to depots, supply centers, holding & reconsignment points. Talks about forklift trucks, tractors, cranes and related equip. Sets up standards, requires activities to inventory, send in reports, tagged DD Form 871s. Perkins McGuire signed it. Effective immediately. 602.

DOD DIRECTIVE 3210.1 OF NOV. 12, 1957

Subj: Principles of the Department of Defense policy on Basic Research. WHAT IT DOES: Sets policy relating to support of basic research. Defines basic research as research with primary aim of fuller knowledge or understanding of subject under study. Directive states sustained support will be given basic research, takes six pages to say it. 603.

SBA CHIEF FORECASTS 1958 AS GOOD BUSINESS YEAR

"My reading of the business barometer indicates that 1958 will be another relatively good year for business." So says Wendell B. Barnes, Administrator, Small Business Administration, in release Dec. 26, 1957. Barnes sees some slump in early part of '58, but sees increase in later part of the year. Construction seen as big item, electronics and spending in missile build-up also noted as aids to American business economy. Barnes notes, "Our agency maintains, throughout its field offices, inventory lists of companies who are capable of producing the full range of items (for Government) and we see to it they are made known to the Government or prime contractors who can use their services." DATA suggests that companies not now on SBA Government contractor list get in touch with SBA, get on list. Write Small Biz, Wash. 25, D. C. 604.

AIR SPACE

GEN. ORVAL R. COOK
PRESIDENT
AIRCRAFT INDUST. ASSOC.

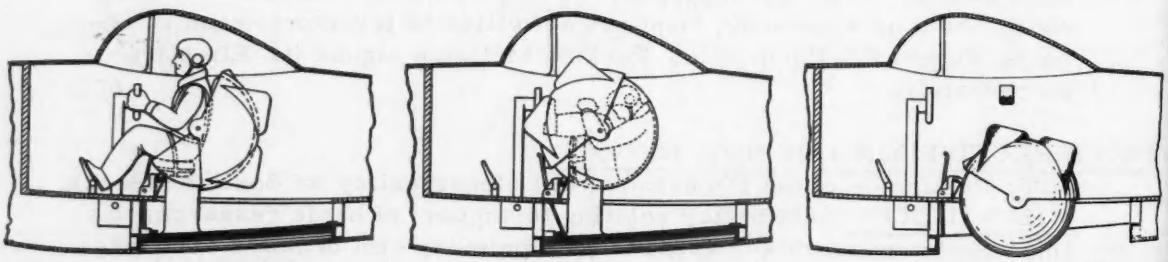
GENERAL OUTLOOK:

It is unusually difficult to forecast the level of activity in the aircraft industry for the coming year. The impact of Russia's scientific progress on the nation's civil and military leaders and on Congress, which currently is scrutinizing the nation's defense posture, has created uncertainty as to our national defense goals and programs. The decisions which will be made in the next few months will have tremendous influence on the aircraft manufacturing industry and its 1958 activities.

It is anticipated that sales for 1958 will continue to be high, running well over the 10 billion dollar mark. This continued high level of sales will result from increased deliveries of guided missiles and commercial aircraft, including first deliveries of turbojet and propjet transports. These are expected to offset the anticipated continuing decline in unit deliveries of military aircraft. Despite this high level of industry activity and sales, it is possible that the imposition of additional restrictive procurement directives, now under consideration by the Government, will cause the 1958 ratio of earnings to sales to be even lower than the 1957 estimate of 2.4%.

By the end of 1958, deliveries of guided missiles are expected to exceed 35% of the total military sales of the industry, and it is anticipated that the unfilled orders for guided missiles will comprise at least 50% of the total military backlog.

At this time, it is anticipated that employment will continue to decline to well below the 800,000 level and that some additional facilities will be closed. There will be no consistent or uniform pattern throughout the industry, and some companies probably will hire additional employees even though industry-wide employment will decrease. It is also anticipated that new facilities especially constructed to handle research, development and production of new weapons will be built.



Operating sequence employed by the pilot of a disabled airplane in which the ball capsule ejection system is installed.

DOWNWARD EJECTION

may become new concept of escape from disabled aircraft. Patent sketch shown above is only one of several advocating downward ejection and utilizing protective capsule. Astronautics magazine in December gives comprehensive descriptions and sketches. 605. ///Astronautics 12-78/

LEVEL-LIFT PLANE

made by Ryan behaves like tail-sitter. Operates in usual flying manner but can take off, land vertically. Can hover. No ground run required. Two large propellers are powered by gas turbine within fuselage. Employs deflected slipstream principle. Valuable as medium-speed reconnaissance or utility plane where terrain is rough. Possesses advantages of helicopter but with speed and range of airplane. Both Navy and Army have share in development, needs for this type plane. 606. ///Pent 1214/

RISING ON A column of fire from its two main powerplants, an Air Force ATLAS intercontinental ballistic missile lifts from its launching pad during a test at the Air Force missile test center, Cape Canaveral, Florida. Although many different types of nose cones have been used on ATLAS, most successful has been to make blunt nose of copper, allow part of copper nose to melt in strong heat of re-entry, actually streamlining nose on downward flight, allowing balance of nose cone to remain cool. ///AF 157612 A.C. 1217/

CHANCE VOUGHT GETS $300 MILLION

for production of new F8U-3 and F8U-2 and continued production of F8U-1. Advanced all-weather F8U-3 is of completely re-engineered design with Pratt & Whitney J-75 engine. F8U-2 looks almost identical to -1 with exception of two fixed low-aspect-ratio ventral fins stuck on tail cone near horizontal stabilizer and slight beefing to accomodate more powerful P&W J57-T-16. 607.///Pentagon OPI 1223/

HELICOPTER CONTRACT FOR $13 MILLION

goes to Kaman Aircraft for prototype quantity of HU2K-1 utility choppers. Winner of Navy BuAer design competition, HU2K-1 is single rotor, departure from previous Kaman designs. U2K-1 will replace HOK-1 and JUK-1 in fleet, will be turbine powered with G-E engine. 608. ///Pent. 1210/

RAMJET TESTING FOR AF

will be made easier with new device called "variable Mach number and angle-of-attack nozzle." Made by General Dynamics' Electric Boat Div., nozzle will aid in supersonic "test flights" conducted at speeds up to 2500 mph, temps to 650 degrees (F) and altitudes over 90,000 feet — all on ground. 609.///ARDC 290 1211/

ALTITUDE TEST CHAMBER TO COST $5 MILLION

will be built for Navy at Trenton, N. J. Chamber will test turbo-jets. 610. ///Navy Times 1214/

NORTH AMERICAN GETS WS-110 AS DATA PREDICTED

in our November issue. AP carried our story Oct. 30, credited DATA as source. SecAF Douglas released same news Dec. 23, saying NAA would build, that plane would travel 2000 mph. DATA went further, named G-E as powerplant contractor, Jack Jones as NAA proj. officer. 611. ///P1223/

RUSKIES HAVE FIELD CATAPULT FOR SHORT-FIELD LAUNCH

says red magazine Soviet Aviation in release Dec. 28. Catapult can be set up in fields or forests, Russians say. 612. ///Tass 1228/

Electron

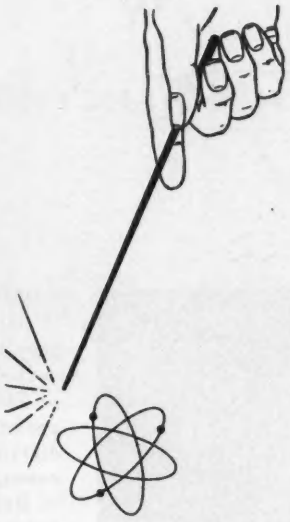
The deep-drawn one-piece molybdenum anode replaces the conventional welded anode.

1907 FANSTEEL 1957 · Golden Anniversary of Progress ·

FANSTEEL

MAGIC

depends on METALLURGY



And as the science of metallurgy advances so does the electronic tube.

Take this X-ray valve tube, for example. Moly for a long time was known as the ideal anode material, but it had to be formed and welded as a two-piece construction.

Now because the Fansteel metallurgist puts more ductility and more uniformity into the metal the anode is *deep drawn* with these benefits:

Fewer tube rejects
Easier assembly
Quicker and more thorough outgassing
180° flared edge
Wall and end thickness uniform
No grooves
No welds

Metallurgical *progress* in refractory metals is an established habit at Fansteel. Try us for difficult problems in molybdenum, tungsten, tantalum and high density metals.

The case history repeated here is typical of the news found in Fansteel Metallurgy, a free journal of information. Ask to be put on our mailing list—all we need is your name and business address.

TALLURGICAL CORPORATION

NORTH CHICAGO, ILLINOIS, U. S. A.

ELECTRONICS COMMUNICATIONS

HERBERT H. ROSEN
WASHINGTON EDITOR
ELECTRONIC WEEK

GENERAL OUTLOOK:

All factors point to sizable growth in the Electronics Industry in the coming year.

The Electronics Industry can be divided into three major divisions: (1) Defense, (2) Consumer, and (3) Industrial.

Defense spending for electronics last year amounted to about $3.5 billion, which was an increase of $700 million over the previous year. Now, with greater emphasis on missiles and their ground support equipment, new defense budget will undoubtedly exceed previous expenditure in defense electronics.

The consumer electronics industry can probably expect increased sales in television sets and repairs. Seven years ago marked the beginning of a high level of television sales. These television receivers are now earmarked for replacement.

But the important development lies in the future of industrial electronics. Within five years industrial electronics spending should reach or surpass defense electronics spending, which now accounts for about one half of the total Electronics Industry income. Other industries in the country are beginning to appreciate what electronics can accomplish. A shrinking labor market coupled with consumer demand for all products will require new techniques to increase production. Electronics appears to be the solution.

The Electronics Industry is made up of about 4,000 firms, of which only a small percentage are large contractors. Small contractors can expect no special consideration simply because they are small. They will have to push harder because 1958 will be a highly competitive year. The last six months proved that even large contractors must be flexible enough to retrench in order to accommodate a defense spending slowdown. Defense will undoubtedly tighten its control over electronics or any other type of contracting. There is a growing trend toward rewarding efficiency and penalizing delays or poor quality. This will be a time of keen competition, but electronics contracts will abound for the shrewd businessman.

PHOTOCHEMICAL STORAGE BATTERY

is needed in quest to have efficient solar power and we still don't really have one, says Air Force Office of Scientific Research. In official publication, Research Briefs, AFOSR states, "Solar energy is readily available, but the processes thus far evolved by man to harness that source of power have been cumbersome, costly, and, at best, inefficient." AFOSR goes on to explain that solar batteries we now have convert light into heat or convert light too rapidly, do not store energy.

613. ///AFOSR Research Briefs 12/

MOBILE FACSIMILE SET

is used by Army to flash pix from one spot to other within five minutes after original photo was taken. System consists of Polaroid camera to take picture, develops automatically, and fax device which rides on back of radio-equipped jeep or car. 614. ///Mil Review 11-65/

SOVIET SCIENTIFIC PAPERS AVAILABLE BUT UNREAD

says Editor Alfred D. Cook of Electronic News. Cook says U.S. is lax in use of Russian literature while Soviet scientists collect and disseminate information from 1800 of our journals. 615. ///Elec News 1223/

***ARMY'S 100-INCH CAMERA**, used for long-range ground reconnaissance, will operate in infrared range and will photograph terrain features as far as 30 miles away. The reconnaissance camera was originally developed by the U.S. Army Signal Engineering Laboratories, Fort Monmouth, N.J., and was designed and constructed in cooperation with the Kalart Company, Inc., Plainville, Conn. ///Army Photo SC 514241/*

CAMERA IN PILOTLESS DRONE

will give Army accurate low-level aerial photos. Drone will drop flares for illumination of target. Reconnaissance system designed and developed by Army in conjunction with Fairchild Camera Corp., Syosset, L. I., N. Y. Designated KA-28, 17-lb. camera, loaded with film for $4\frac{1}{2}$x$4\frac{1}{2}$ inch negatives, and equipped with controls for image motion compensation (IMC), may be installed in either manned aircraft or pilotless drone. Photoflash cartridge ejector unit designed by Armament Division of the Universal Match Corp., St. Louis. 616. ///Pentagon OPI 1227/

NEW NAVY TRANSMITTERS

are the AN/WRT-1, AN/WRT-2, AN/SRT-14, AN/SRT-15, AN/SRT-16. First two, WRT-1 and -2, are still under evaluation. Others have been bought, slated for fleet use. WRT-1 and -2 are 500-watt transmitters with -1 covering 0.3 to 1.5 mcs band and -2 on higher freqs. of 1.5 to 3.0. SRT-14 is nominal 100-watt transmitter for CW, voice radio teletypewriter, and facsimile operation over range of 0.3 to 26 mcs. Addition of 500-watt booster to -14 creates SRT-15, additional source of 220 or 440 volt three-phase 60 cycle power makes SRT-16. The -14 is basic building block. New transmitters will modernize Navy ship-shore broadcasting. 617. ///Naval Communications Bulletin 12-8/

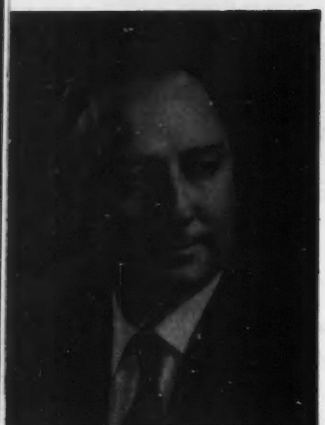
ELECTRONIC "PRIVATE EYE" TESTS GUNS

for Navy's Bureau of Aeronautics. New electronic device built by Westinghouse tests accuracy of aircraft guns in flight without firing them. Does it in minutes instead of hours. Built into plane as part of gun-aim system, test equipment weighs less than 15 lbs. 618. ///Pent OPI 1213/

COMBAT SURVEILLANCE STUDY

given to Cornell Aero Lab. Signal Corps awards two-year contract for evaluation of all major programs of combat surveillance in Army, for review of tactics in relation to future, and for recommendation on new policies. Systems to be surveyed include radar, infrared, sonic, meteorological, drone reconnaissance, photographic and televisual. Office of study will be in Washington, D. C. 619. ///Pentagon OPI 1219/

CONSTRUCTION



W. G. DOOLY, EDITOR
THE CONSTRUCTOR

GENERAL OUTLOOK:

Highway construction is undoubtedly the brightest element in the over-all construction picture for the coming year and will become the most dynamic force in construction in years to come. It will generate in turn increases in industrial and residential construction. Small construction contractors or subcontractors will directly benefit thereby.

There will also be an increase of as much as 15 percent in residential construction thru relaxation of credit controls. My outlook shows a potential of about $49 billion in new construction in 1958, approximately 4 percent above the dollar volume estimated for 1957. This will be sparked by an increased volume of state and local public works as well as the activity already noted.

The lone major decline foreseen will be military construction. However, this will be more than offset by increases in practically every category of state and local activity, including public educational construction, sewerage and water supply facilities.

While there is nothing in the outlook for an increase in military construction, this does not take into account any sizable government spending in the missile base construction field. But such a project would have to reach the magnitude of the MANHATTAN PROJECT before it would affect the over-all picture to any extent, since military construction constitutes only 2-4/10 percent of the total new construction figure.

Construction, as the nation's largest production activity, accounts for 15 percent of the gross national product when the value of maintenance and repair operations is added and has served as an effective stabilizer in the economy when unhampered by regulation. As in the mild setbacks of 1949 and 1954, construction as a whole has proved to be a bulwark of strength in any business slowdown.

CONSTRUCTION FOR SNARK MISSILE UNIT

at Presque Isle AFB in Maine will begin this month. AF will acquire land soon. Under operational control of SAC's Maj. Gen. W. C. Sweeney, SNARK unit construction will cost estimated $12 million.

620. ///Pentagon OPI 1213/

ARMY PLANS FIRST NUCLEAR POWER PLANT

for actual field use. Site will be Ft. Greely, Alaska. Contract for construction will run to $6 million. Basic design completed by Alco Products of Schenectady. 621. ///Pentagon OPI 1218/

CAPEHART HOUSING AT LINCOLN AFB, NEBRASKA

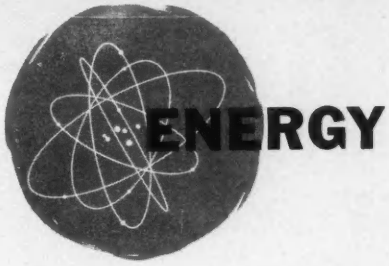
will open for bids Jan. 29 for construction of 600 housing units. Construction will begin early this year. 622. ///Armed Forces Press 1215/

ATOM INSTRUCTION HALL

is under construction at New London submarine base in Connecticut. The $1 million Cromwell Hall will be devoted to instruction on nuclear propulsion. Scheduled completion June '58. 623. ///Navy Times 1221/

NSF APPROPRIATES $3.1 MILLION FOR OBSERVATORY

in western U.S. Site still undetermined, but National Science Founation leans toward three mountain sites in Arizona. 624. ///NSF 1213/



GENERAL OUTLOOK:

Hard economic facts will make 1958 a year of "reappraisal" for the nation's atomic energy program.

Put simply, electric power produced from nuclear reactors cannot now compete in the United States with power from conventional fuels. Nuclear power may become competitive in a decade or so, provided a great deal of hard work—and hard cash—are put into it.

The AEC, in its "partnership" program, has hoped to rely on private industry for most of the investment in "demonstration" power plants, with help from the Commission in research and development, waiver of fuel charges, and the like. Eventually, nuclear power would stand on its own feet, without Government assistance or subsidy in any form.

But the time is not yet. And the cost looks too great for private industry, even with AEC "partnership" help.

Yet for reasons of national policy, there is pressure to get on with the job. U.S. leadership in "atoms for peace" is at stake. Power-hungry nations may provide a market, if the U.S. has safe, efficient equipment for export. But they may turn to Britain, or to Russia, if we wait for normal industrial development.

Subsidy to industry may be the answer, or AEC construction of prototype plants. Both courses are controversial: "give-away" on the one hand, "public power" on the other. But the shadow of SPUTNIK may dim these controversies; many in Congress feel a sense of urgency for more rapid progress.

In any event, AEC spending for atomic energy programs, military and peaceful, was $2 billion for fiscal 1957; it won't be less in 1958, and it could be more.

Energy Outlook written for DATA by William G. Raleigh, Managing Editor, ATOMIC INDUSTRY REPORTER and member of Board of Directors of the Bureau of National Affairs.

AEC REVAMPS RADIATION EXPOSURE LEVEL

to lower limits. AEC has reduced permissible radiation exposure level for atomic workers by two-thirds, from 15 rems a year to five rems a year. Roentgen Equivalent Man (rem) unit is used to measure the biological damage caused by radiation. New standards were recommended by National Committee on Radiation and Measurement. 625.///AEC 1210/

NAVY WILL TRAIN ABOUT 650 NUCLEAR REACTOR OPERATORS

at AEC's National Reactor Test Station, Arco, Idaho, this year. 626. ///Navy Times 1221/

WESTINGHOUSE GETS $46,050,000

to furnish reactor compartment components for Navy's new nuclear-powered aircraft carrier (CVAN). R/Adm. Mumma, Chief BuShips, said contract was for reactor instrumentation, controls, valves and pumps. 627. ///Pentagon OPI 1217/

ACCELERATOR FOR ARGONNE LAB

will cost $27 million. AEC authorizes construction of 12.5 billion electron volt (bev) proton accelerator at Argonne National Lab, Lemont, Ill. Expected to be in operation in four to five years. Unit will be used as research tool in high-energy physics studies. Soviets say they already have similar 10 bev unit in operation. 628. ///AEC 1212/

LOGISTICS : MATERIALS

CONCRETE WINGS

used by French in flying tow targets are reinforced concrete made with prestressed steel cables imbedded in mixture. Concrete, so smoothly polished it looks like glass, offers many advantages over metals in airframe, missile construction. Resists heat to much higher degree than any metal, will not lose shape or strength and with imbedded cables is flexible as well. French flying targets, called ECA 56 and 57, are said to move at Mach 0.8 speeds, use honeycomb construction as weight saver. ONR following progress. 629. ///Mil Review 11-70/

RETURNABLE FOLD-UP BAG FOR OIL TRANSPORT

is being tested to replace steel tankers. Developed by two Cambridge University professors, sea-going flexible bag is 67 feet long, 3 feet dia., capacity is 10 tons. Towed through water like downed blimp, at destination bag is emptied, folded up, can be sent back to oil shipper by air or boat to be used for another load. High costs of oil tanker round trips may be cut by use of this lightweight bag. Cost is about one-seventh of conventional tanker. 630. ///N Y Journal of Commerce 1211/

MICROBES MAY PRODUCE FUELS, EXTRACT METALS

according to Bureau of Mines spokesman, Walter N. Ezekiel. Bureau is conducting research in two main fields. One aims at using minute organisms to produce liquid fuels from coal and oil shale. Other studies possibility of having micro-organisms aid in process of separating metals from ore. Success already reported in latter field. At Boulder City, Nev., bacteria cultures have extracted up to 99 percent of the manganese in some ores. One approach lets bacteria cultures digest metallic elements so they can be extracted in purified form from run-offs of the living fluids. 631. ///Bureau of Mines 1228/

NEW ENGINEERING PLASTICS

announced by Du Pont will make bows beginning 1959. DELRIN is strong and resilient — approaches metals like aluminum and zinc in strength, has low coefficient of friction, resists solvents, recovers from deformation, has dimensional stability. TEFLON 100-X is described as plastic that knows when it's melted. This is perfluorcarbon resin, Unlike TEFLON tetrafluorethylene resins, new 100-X has melt viscosity comparable to standard plastics, makes extrusion and molding easier. ALATHON is new type polyethylene, not as flexible as old, will be used in industrial fibers and for molded products needing more stiffness than conventional polyethylene allows. 632. ///Du Pont Magazine 12/

***ARTIST'S CONCEPTION** of the U.S. Army nuclear-powered overland carrier. A special logistical cargo carrier utilizing nuclear power is under study by the Army Transportation Corps. A nuclear-powered electrical generator would be carried in the rearmost element of the train, and each wheel would have an electric motor built in so that power could be applied to the train. As envisioned by the Army, this train would be able to carry up to 150 tons of cargo over cross-country terrain, without benefit of roads, at speeds of up to 20 miles per hour. ///Army Photo SC 514142/*

AIR FORCE BEATS DRUMS FOR BERYLLIUM

but problems loom. Air Materiel Command Hq. at Wright-Patterson in Ohio proudly files away its single thin sheet of beryllium — half world's supply — and hopefully awaits breakthrough in production. Six times stronger than steel, one-third as heavy as aluminum, able to withstand heat up to 1200 degrees (F), beryllium is as hard to bend as plate glass, is respectfully resistant to all known cutting tool materials. AMC wants to bring this metal into production lines, is desperate for methods. AMC Manufacturing Methods Branch in Industrial Resources Division at Wright-Pat would welcome ideas. 633. ///AMC 1214/

WIDER RANGE FOR SOLION

in commercial applications is hope of National Carbon of Cleveland and other industries. Naval Ordnance Lab, proud papa of Solion, announces Natl. Carbon pitch. Solion is basic electronic component for sensing and controlling circuitry in low frequency spectrum, first disclosed by NOL in late summer of '57 (DATA article 346 in August '57 issue). Sensitive to extremely minute stimuli, Solion can perform many of functions heretofore performed by gas-filled and vacuum tubes or more recently by transistors. Consumer and industrial electronic companies now knocking on NOL door for more info. DATA readers invited to write Naval Ord Lab, Tech Info 1-179 White Oak, Silver Spring, Md. for Solion applications. 634. ///NOL 1201/

NEW HEAD OF INTERSERVICE SUPPLY

is Maj. Gen. C. J. Bondley, Jr., Dir. Supply and Services AF. Bondley assumed chairmanship of Interservice Supply Support Committee (ISSC) Jan. 1, 1958. 635. ///Pentagon OPI 1227/

ORDNANCE

ARMY ORDNANCE ASKS FOR BIDS

on quantity production of the E-30R-1 flame thrower. Developed by Aerojet. Army will also purchase E-30R-1 for Marines.

636. ///Aero-Gen 1215/

OTHER APPLICATIONS FOR EXPLOSIVE ACTUATORS

are being studied at the Naval Ordnance Lab. Typical uses of actuators at NOL are: driving pistons in explosive switches or cable cutters; providing gas for shearing explosive bolts; rupturing diaphrams in explosive valves. Explosive type materials for actuation purposes have some advantages over electronic gear in that explosives have long storage life whereas temp, humidity, accelerations, etc., can put electronic equip out of commission. Moreover, only ignition is required to set off explosive materials and they work quickly. 637. ///NOL 1215/

GUIDED MISSILES ON THREE CRUISERS

will be the TALOS and TARTAR. Birds will be installed on CHICAGO, ALBANY and FALL RIVER. Cruisers will have launchers installed both fore and aft. CHICAGO will be converted at San Fran Naval Shipyard, ALB at Boston, FALL RIV at Puget Sound. 638. ///Pentagon OPI 1217/

OPERATIONAL READINESS AT THULE

is most difficult of any U.S. base. Winter in Greenland requires heated ammunition storage bunkers near each gun so sensitive fuzes can always be ready at operating temps; each gunpit has warmup points for manning crews. Each gunsite has tv set so instructions can be relayed simultaneously, objectives can be shown. 639. ///Mil Review 11-34/

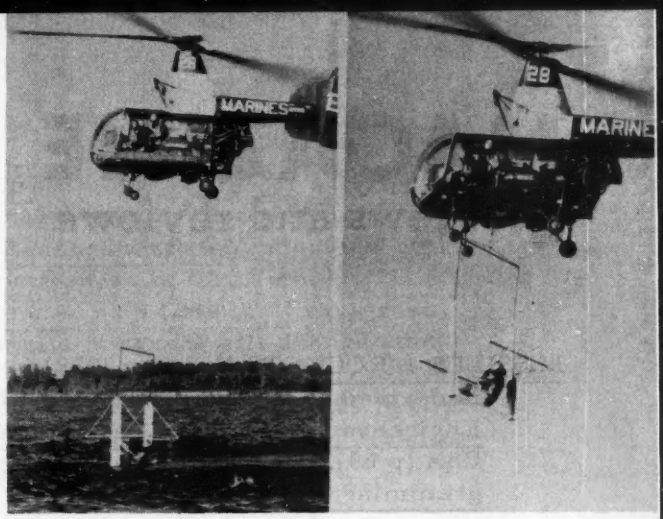
MINES MONITORED AT NOL

by new telemetering system. Transistorized underwater telemetering can monitor maximum of four mines for periods of at least six months. Previous method relied on direct cables to mines which were subject to frequent breaks. New method consists of transistorized transmitter placed inside each mine; transmitting transducer located on each mine case; receiving hydrophone located in vicinity of mine field; and special receiver with associated recording equip located at shore station.

640. ///NOL 11-1/

ARMY TO ACTIVATE THIRD REDSTONE UNIT

at Ft. Sill in February. The 2nd Battalion of the 333d Field Artillery will form third REDSTONE missile unit. 641. ///Pentagon OPI 1213/



GETTING SCOOPED *— Marine Sgt. W. M. Hughes, a simulated casualty, draws a free ride as he takes part in the evaluation trials of a new helicopter rescue hoist at Camp Lejeune, North Carolina. Employing air-sea rescue method recently developed by the Naval Medical Field Research Laboratory, the 'copter was able to lift Sgt. Hughes from nearby New River by coming up behind and using its nets as a huge scoop.*
///USMC Photo A-405762/

ARMY PHYSICISTS EXPLORE WEATHER

with "firecrackers." SigCorps scientists at Ft. Monmouth, N.J., have been exploring weather up to 60 mile altitudes with high explosive firecrackers built into noses of AEROBEE sounding rockets. Time taken for sound of explosion blast to reach ground gives scientists accurate indication of winds and temperatures. After readings are analyzed, data will be made available to scientists from more than 40 nations in participation with IGY. 642.///Pentagon OPI 1230/

AFOSR STUDIES RECOMBINED OXYGEN

as method of obtaining more effective missile propulsion. Energy derived from recombined oxygen atoms in upper atmosphere, with combination brought on by catalyst, is under study at Rensselear Polytechnic Institute. If successful, vast weight reductions would be possible in missile design since missiles would not need to carry as much stored oxygen. They could obtain much of oxygen for combustion through recombination process. 643.///AFOSR Research Briefs 12/

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MISSILES & ROCKETS (January 1958)

is devoted to ground handling and launching equipment. "Should Army Engineers Support the Missile Industry?" by Lt. Col. C. M. Parkin, Jr., USA (p 69). Roundup of Surface Equipment Contractors (p 74). "Programming Weapon System Support Activities," by J. Dresner (p 80). "What Can Industry Do to Simplify Missile Ground Handling Support?" by B. J. Wald (p 85).

SIGNAL (January 1958)

"Electronics in the USSR" written by four-man team of top U.S. electronic engineers who made 10-day inspection tour of Moscow and Leningrad electronic facilities. Trip was made under auspices of U.S. State Dept. and at invitation of Soviet Ministry of Radio Industry and Popov, Russian equivalent of IRE (p 12). Senator Saltonstall talks about "Small Business and National Security" (p 20). "Electronics and the Strategic Air Command" by SAC Commander, Gen. Thomas S. Power (p 24). Spread throughout magazine, forecasts on 1958 electronic picture from Western Union, IT&T, RCA, AT&T and Gen. Telephone. Article called "Technical Manpower" by James M. Bridges, Dir. of Electronics, in SecDef (R&E) talks of skilled personnel shortages, how to combat them (p 45).

ORDNANCE (January 1958)

"Adequate Armament Now" by Mark Watson of Balt. Sun, tells how our Army requires proper weapons for all kinds of jobs to fulfill its global commitments (p 620). "Soviet Air Transport" by Garrett Underhill is article discussing USSR transport aircraft that could easily be converted to military use. Underhill suggests we do same (p 624). "Missiles of the USSR" by Alfred J. Zaehringer, Pres., American Rocket Co., discusses operational and developmental Russian missiles (p 639). "Shootingest Army" is Jack Weller's story of marksmanship training of 7th Army in Europe under command of Lt. Gen. Bruce C. Clarke who wants 80 percent of his men to be qualified sharpshooters (p 649).

EBONY (January 1958)

"Negro Progress" mentions work and has picture of Brig. Gen. Benjamin O. Davis, Jr., who is Deputy Chief of Operations USAFE (p 86).

POPULAR MECHANICS (January 1958)

"New Landmark for Brussels...the Atomium" is atomic energy exhibit (p 99). "Forecast: A Sky Full of Satellites" (p 138).

U. S. NEWS & WORLD REPORT (Dec. 20, 1957)

"This Is NATO" is organization summary, in chart form (p 32). "Despite Russia's Missiles We Can Feel Reasonably Safe" interview with Gen. Thomas S. Power, discusses effectiveness of SAC (p 62). "$2.5 Billions for Missiles, and More to Come — Who Gets It?" says vast expansion now under way in guided missile program will change communities across nation; tells who will benefit and where big growth is to come (p 64). "Assignment: Arm U.S. for Space Age" concerns SecDef McElroy and job he faces in top defense position; says official Washington is impressed with him and actions he has taken (p 68).

LIFE (Dec. 23, 1957)

"Aerial Protector Around the World" describes vigilant patrol of SAC bombers; bases in Morocco used as examples (p 41). "Keeper of Peace in the Pacific" says U.S. 7th Fleet is largest, most integrated and most powerful naval force ever assembled on permanent basis in peacetime; discusses effect 7th Fleet has on Far Eastern allies of U.S. (p 52).

TIME (Dec. 23, 1957)

"Break up the Joint Chiefs" discusses Lt. Gen. James Gavin's recommendation for competent military staff of senior military people working directly for SecDef (p 12). "Shot Down" tells about DOD halt on establishment of AF Directorate of Astronautics (p 14). "On the Spot" concerns Guided Missiles Director William M. Holaday (p 12).

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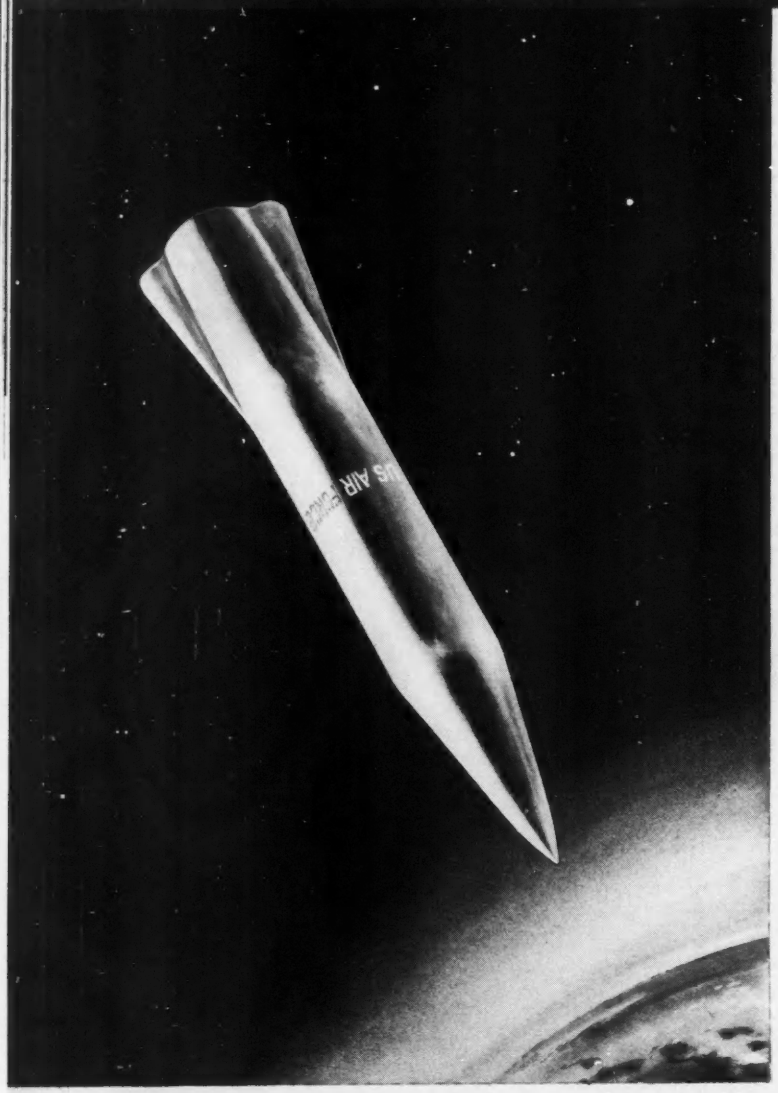
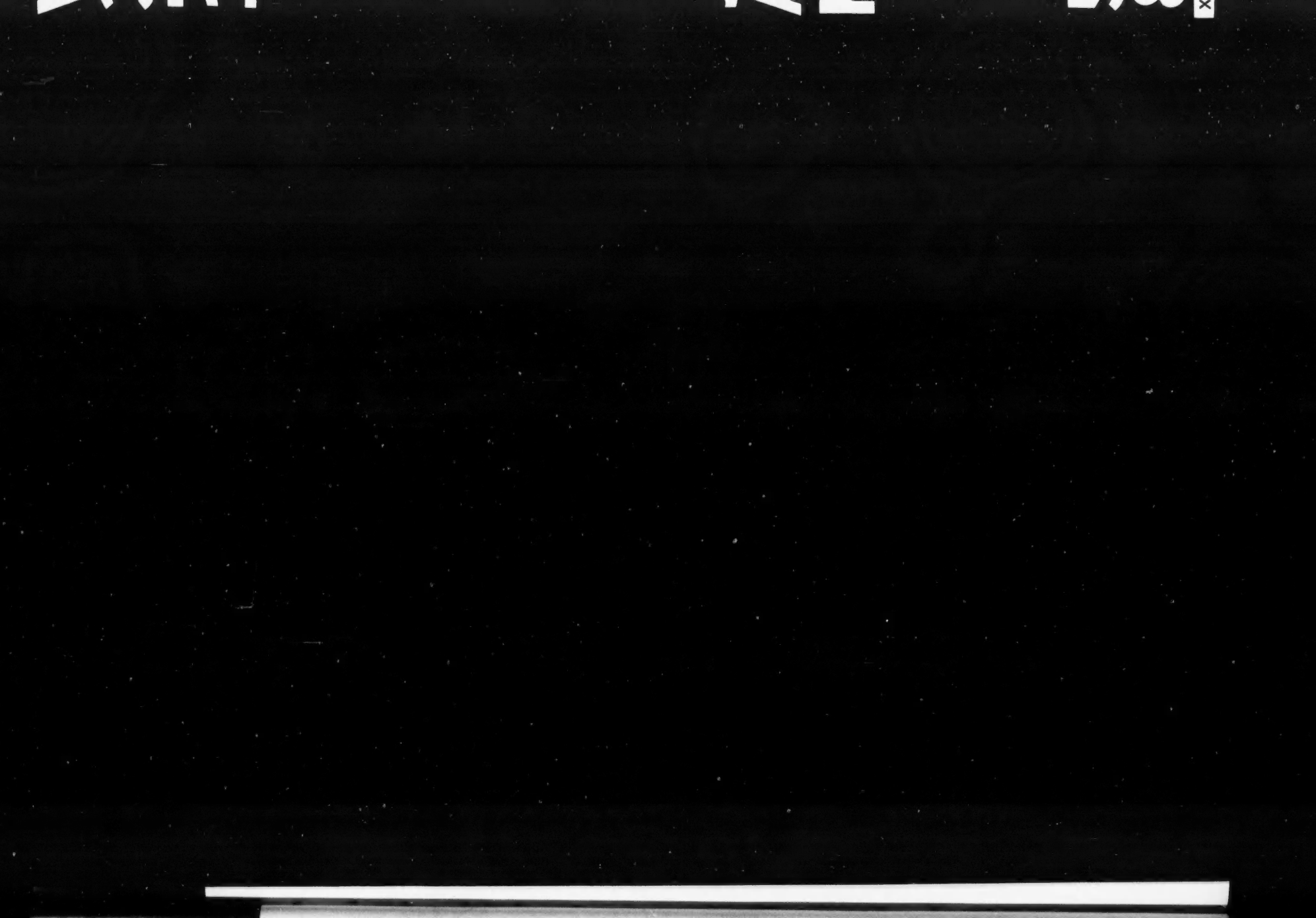
ATLAS



RELEASED BY THE AIR FORCE especially for DATA on Christmas Eve, an AF artist's concept shows clearly for the first time the flared tail of ATLAS. Actual operational ATLAS separates nose cone from airframe, would not be all in one piece in re-entry as shown here; but test vehicle ATLAS does not separate, hence sketch is of ATLAS test vehicle.

Another "first" for DATA on the ATLAS in this issue is the news published in our AIR/SPACE section (p. 10) of the use by ATLAS of copper-coated nose cone, manufactured by G-E at Missile and Ordnance Systems Department in Philadelphia, which solves re-entry problem by partially melting from the friction-induced heat. Adsorption of heat by the copper in melting keeps rest of cone relatively cool. Probe stuck in blunt nose on upward trip serves collateral duty of collecting melted copper by capillary action on return trip, forming more pointed nose as shown. ///AF 156535 A.C. 1224/

USAF–CONVAIR ATLAS is powered by two 165,000-lb. thrust boosters plus 100,000-lb. thrust sustainer motor, making 430,000-lbs. total thrust. ATLAS appears to be first of big missiles to reverse normal fueling procedure since LOX (liquid oxygen) valve has been shown in photos to be at top of missile airframe rather than near fins as with other U.S. big missiles.



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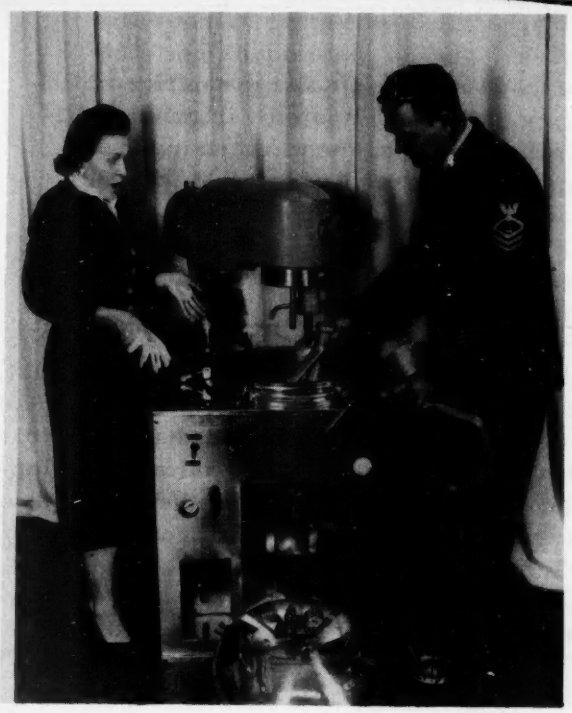

***UNIMIKE COMMISSARY MACHINE** surprises Navy wife Mrs. Marjorie L. Mitchell, as she hears from Chief Commissaryman Ennis Brown that new **UNIMIKE** can do everything in a kitchen except feed the baby and hang the wash. Although not fully evaluated for the Navy, the device, developed for small ships and submarines at the Commissary Research and Development Facility of the Navy Supply Depot, Bayonne, N.J., is designed among other things to pressure cook, boil, deep-fat-fry, refrigerate, dispense drinks, peel vegetables, serve as a mixer, and proof dough. ///BuSandA USN 1D26550/*

CHANCE VOUGHT A/C WILL ESTABLISH DAYTON OFFICE

to woo Air Force, key CVA official in Dallas revealed. Chance Vought, long known as exclusive Navy contractor, is now eager to socialize, wants AF biz. CVA looks for USAF missile bids, figures office at Air Materiel Hq, Wright-Pat AFB, Dayton, will aid blue bonnet pitching. CVA not alone in this urge. Other BuAer mainstay, Grumman, also wants to leave Navy type-casting. Grumman pitched for AF air-to-ground missile contract, lost to North Am., will keep trying says Grumman Wash. rep V/Adm. Joe Bolger (Ret.). 644. ///DATA Composite/

McDONNELL F-101B WILL CARRY ATOMIC "GENIE"

missiles. Two-seater version of F-101A VOODOO which recently set new world speed mark, will be all-weather fighter. AF says atomic GENIE, formerly called DING DONG, will give 101B capability of "downing entire formations of enemy bombers." Douglas builds GENIE. McDonnell has received contracts totalling $500 million for various versions of VOODOO. 645. ///USAF Information/

ARMY BUYS PLASTIC BOATS

for assault crossings of rivers, streams and other water obstacles. Lightweight plastic boat carries 15 men, built for hand paddling but can take 25 hp outboard motor. Contract, valued at $1,053,428, went to Correct Craft of Pine Castle, Fla. 646. ///Pentagon OPI 0103/

FACT SHEET ON OPERATIONAL ARMY AIRCRAFT

was published by Dept. of Army Jan. 10, describes L-19A, L-20, L-23, U1A, H-13, H-19, H-21, H-23, H-34, H-37. Four-page fact sheet is good reference piece. Send us stamped addressed envelope and we will send free on request. 647. ///Pentagon A 0110/

FACT SHEET ON PENTAGON AVAILABLE

was published by DOD, is handy reference on world's largest office building. Gives information on construction, telephone system, internal facilities, building population, parking, transportation. Send us stamped addressed envelope and we will send free on request. 648. ///Pent. 1218/

LIGHTWEIGHT MINE DETECTOR

developed by Army engineers weighs only one fourth of current standard model. Seven-pound detector, designed to locate mines with metal components, is equipped with transistors instead of electron tubes, has four times battery life of standard model. In addition to reducing overall weight, sensitivity has been increased and stability improved. Maintenance, always a problem in field, has been simplified to such a degree that operators can perform major repairs. Built by Texas Instruments of Dallas, development was accomplished at Ft. Belvoir, Va. Texas Instrument has production contract, is now field testing with Army. 649. ///Pentagon OPI 0103/

CHRYSLER RECEIVES $52 MILLION

for missile work. A total of approximately $30 million is for partial 1958 purchases for 1500-mile JUPITER IRBM, and contracts cover long lead-time components and ground support equipment for missile system. An additional $21,800,000 covers continuing purchases for REDSTONE system components. Chrysler produces JUPITERs and REDSTONEs at Warren, Mich. 650. ///Pentagon OPI 0104/

ARMY SEEKS $627,670,000 FOR CONSTRUCTION

for Civil Works Program as part of President's budget. In "Construction General" program for fiscal year 1959, funds are requested for 164 continuing projects. Funds are also requested for 33 planning projects. For list of projects on which requested construction and planning funds would be spent, DATA readers are invited to write to Army Branch, News Division, Rm. 2E757, Pentagon, Wash. 25, D. C. 651. ///Pentagon OPI 0113/

REDSTONE WILL BE PHASED OUT

according to release of SecDef McElroy Jan. 10. Army has been authorized and directed to proceed immediately and on top priority basis with development of solid propellant ballistic missile which will succeed the REDSTONE liquid propellant missile. McElroy pointed out recent advances in solid propellant technology resulting in large part from Army's SERGEANT and Navy's POLARIS programs make it possible to start immediately on new, more reliable, solid propellant missile. Liquids

are more dangerous to handle, solid propellants are more reliable. New solid propellant missile, as yet unnamed, will be smaller, lighter and more mobile than REDSTONE. 652. ///Pentagon OPI 0110/

SUBMARINE RECIPE SECTION

will soon be issued by the Navy Subsistence Office. Consisting of 109 recipes, the supplement includes the favorite dishes of the submarine crews. Commissarymen of the submarine forces submitted many of the mouth-watering favorites of the underwater fleet. Other recipes were developed for use on the special project cruise of the USS TORO. Some of the recipes listed on the Submarine Recipe Section, Supplement One, include Ma's Swell Chocolate Cake, periscope pizza, sonar-ping peanut butter fudge, Yankee Sea Pie and Chinese fried cabbage. For more information write Dept. of Navy, Bureau Supplies and Accounts, Wash. 25, D. C. and ask for Submarine Recipe Section, Supplement 1, NAVSANDA Publication No. 7. 653. ///BuSandA bulletin/

NORTH AM A/C PLANS TO BUILD WS-202 INTERCEPTOR

it was revealed when NAA Director of Material, Don Peitzke, announced William May of NAA would get new position as Manager of Subcontracts and Subsystems. On what project? Frank Weixel holds this post on new WS-110 bomber. Peitzke said May will be concerned with WS-202 long range interceptor programs. AF Press at Pentagon said they new nothing of "go-ahead" plans at NAA on long range interceptor. 654. ///NAA/

FAIRCHILD GETS TARGET DRONE ENGINE ORDER

for bantamweight J44 jet engines amounting to more than $1,300,000. New order calls for undisclosed quantity of engines to power high speed Navy FIREBEE target drones being built by Ryan in San Diego. Navy sponsored design of 1000-lb. thrust J44 in 1947 which has since proved popular in various missiles, targets and VTOL experiments. 655. ///Op 505 0113/

SMALL BIZ RECEIVED $3.5 BILLION FOR DEFENSE WORK

in FY 1957. Actual figure of $3,464,000,000 in payments for defense subcontract work from 216 military prime contractors was almost equivalent to $3,780,000,000 paid directly to small biz firms by Army, Navy and AF during same period. Prime contract awards to small biz represented 19.8 percent of total of $19,133,000,000 awarded to all business firms during year. 656. ///Pentagon OPI 1226/

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